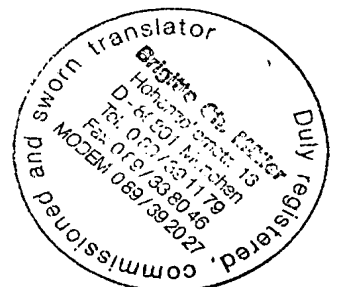


Patent Claims

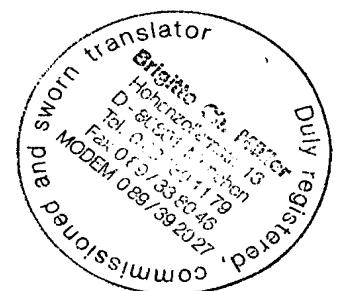
1. Retaining device (200) for the manual removal of teat cups with

a fastening device (201) for fixing the retaining device at a predetermined milking position,

wherein the retaining device (200) furthermore is formed to hold each of a multiple number of teat cups (210) in a fixed position relative to the others during a first operational phase, and to allow manual access to each of the retained teat cups (210) in such a way that, during a second operational phase, each teat cup (210) is manually movable relative to the retaining device (200) and at least one additional teat cup (210) in more than one direction.
2. Retaining device according to Claim 1, wherein the retaining device has a container (203) in which the teat cups are introduced at least partially during the first operational phase.
3. Retaining device according to Claim 1 or 2, which furthermore comprises a guide device (204) for guiding milk hoses (202) during the movement of the teat cups (210) relative to the retaining device.
4. Retaining device according to one of the Claims 1 to 3, which furthermore comprises a controllable vacuum switching mechanism (205) that is formed to apply an operating vacuum to each of the teat cups in a controllable manner.
5. Retaining device according to Claim 4, wherein the vacuum switching mechanism (205) has a control switch (207) for each of the teat cups.
6. Retaining device according to Claim 4, wherein the vacuum switching mechanism (205) has an operating mechanism that switches the operating vacuum depending on the distance of the teat cup from the retaining device.



7. Retaining device according to one of the Claims 4 to 6, wherein the vacuum switching mechanism comprises a turn-off device (220) that is formed to decouple a teat cup from the operating vacuum individually and automatically in the case of a loss of the milking vacuum in that teat cup.
8. Retaining device according to one of the Claims 1 to 7, which furthermore has several connectors that make possible a connection to one or more milk hoses that connect the retaining device to a milking installation and to a vacuum line of the milking installation.
9. Retaining device according to Claim 8, which furthermore has hose sections, wherein one end of each is connected to a connector and wherein the other end of each can be connected to a teat cup.
10. Retaining device according to Claim 9, wherein each hose section has at least one control hose section, which can be connected on one end to a teat cup and on the other end to a corresponding control connector.
11. Retaining device according to one of the Claims 1 to 10, wherein the fastening device has a holder for attachment to a milking parlour support.
12. Retaining device according to one of the Claims 1 to 11, wherein the fastening device can be adjusted in such a way that the longitudinal axes of the milking cups are arranged virtually horizontally.
13. Retaining device according to one of the Claims 1 to 12, wherein the fastening device is formed in such a way that the retaining device can be moved from a first position, which corresponds to the first operational phase, into at least a second position for cleaning at



least an area of the teat cups.

14. Retaining device according to one of the Claims 1 to 13, wherein at least an area of the retaining device is manufactured of plastic, said area holding the teat cups.

15. Retaining device according to one of the Claims 1 to 14, which furthermore has one or more cleaning connectors.

16. Retaining device according to Claim 8, wherein at least one connector is provided with a controllable valve.

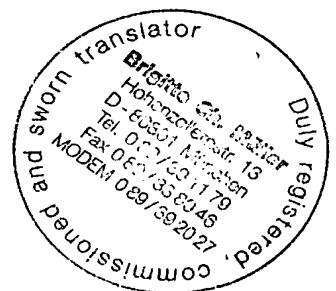
17. Retaining device according to Claim 16, wherein the controllable valve can switch the vacuum to one of the teat cups.

18. Retaining device according to Claim 16 or 17, wherein the controllable valve can be operated electrically.

19. Retaining device according to one of the Claims 1 to 18, which furthermore has a cleaning device that can be moved from a first cleaning position in the first operational phase, in which the head piece of the teat cup liner can be exposed to the action of a cleaning fluid, into a second position for releasing the teat cups for the second operational phase.

20. Retaining device according to Claim 19, wherein the cleaning device is provided with a sealing element for sealing the teat cup liner interior in the cleaning position.

21. Retaining device according to Claim 20, wherein the sealing element has at least one nozzle element for the influx of a cleaning fluid into the teat cup liner interior.



22. Retaining device according to one of the Claims 1 to 21, which furthermore has a power supply unit.
23. Retaining device according to Claim 22, wherein the power supply unit is pneumatically driven.
24. Retaining device according to one of the Claims 1 to 23, which furthermore has a sensor element that is formed to register the milk flow at least from one teat cup.
25. Retaining device according to one of the Claims 1 to 24, which furthermore comprises a quality sensor element that is formed to register at least one characteristic identifying the milk quality.
26. Retaining device according to one of the preceding claims that furthermore has a stimulation mechanism that is formed in order to have a mechanical effect on at least one milk hose and / or control hose that connects a teat cup to the retaining device during the second operational phase.
27. Retaining device according to Claim 26, wherein the stimulation mechanism has a drive element and an actuator element coupled thereto, wherein the actuator element is in contact with the minimum of one milk hose and / or control hose during the milking.
28. Retaining device according to Claim 26 or 27, wherein the stimulation mechanism comprises a control mechanism that is formed to control the frequency of the mechanical action and / or the strength of the mechanical action.
29. Retaining device according to one of the Claims 1 to 28, which furthermore has a



holding area in each case for holding a teat cup, wherein each holding area comprises a fixative device that is formed to establish the orientation of the teat cup that is manually introduced into the holding area to a pre-defined orientation.

30. Retaining device according to one of the Claims 1 to 29, wherein hose sections are provided for connection to the teat cups, said hose sections having at least one profiled area and a corresponding guide section for guiding the profiled area.

31. Retaining device according to Claim 30, wherein the hose section has a milk hose and at least one control hose that are connected in such a way as to define the profile of the profiled area.

32. Retaining device according to one of the Claims 1 to 31, which furthermore has a device for pulling hose sections coupled to the teat cups into a position for post-milking during the second operational phase.

33. Teat cup cluster with

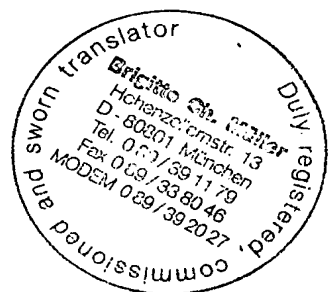
a multiple number of teat cups,

a multiple number of connection hoses that are connected to the teat cups and

a retaining device according to one of the Claims 1 to 32.

34. Teat cup cluster according to Claim 33, wherein the connection hoses have a milk-conducting line, a control line and / or a stimulation line.

35. Teat cup cluster according to Claim 33 or 34, wherein each connection hose has at



least one milk-conducting line and a control line with a shared hose sheath.

36. Teat cup cluster according to Claim 34 or 35, wherein the connection hoses have a profiled section in each case that allows the guiding of the connection hoses for avoiding twisting of the connection hoses.

37. Teat cup cluster according to Claim 36, wherein a guide is provided for guiding the profiled area of each connection hose.

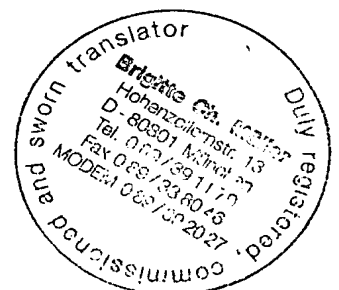
38. Teat cup cluster according to Claim 36, wherein each connection hose has at least one milk hose and one control hose, which are connected to each other in order to define the profiled area.

39. Teat cup cluster according to one of the Claims 32 to 38, wherein each connection hose or each teat cup has an operating control in order to make it possible to switch the milking vacuum to each teat cup.

40. Teat cup cluster according to Claim 39, wherein the operating control comprises an electric switch.

41. Teat cup cluster according to one of the Claims 33 to 40 and according to Claim 29, wherein each teat cup has a cup fixative device that, in interaction with the fixative device, guarantees the predefined orientation of each teat cup.

42. Teat cup cluster according to one of the Claims 33 to 41, wherein each teat cup has a valve element that is formed to introduce, in a controlled manner, atmospheric air below the fold area during the folding of the teat cup liners during the release phase.



43. Teat cup cluster according to Claims 42 and 29, wherein the stipulated orientation of each teat cup is established in such a way that the valve element of each teat cup is located in a predefined position.

44. Teat cup cluster according to Claim 43, wherein the retaining device is formed in such a way that each pre-defined position allows a connection with an external connector of a cleaning device.

45. Milking parlour with

a support for holding and guiding a milk line and a control line,

a multiple number of teat cups that are connected to the milk line and the control line in a fluid connection and

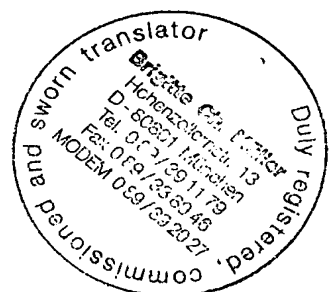
a retaining device according to one of the Claims 1 to 32.

46. Milking parlour according to Claim 45, wherein the retaining device is mounted on the support by means of the fastening device.

47. Milking parlour according to Claim 46, wherein the retaining device is mounted on the support in such a way that it can pivot, so that the retaining device can be pivoted at least into the milking position and a cleaning position.

48. Milking parlour according to Claim 47, wherein the retaining device can be pivoted into a disinfection position for intermediate disinfection of the teat cups.

49. Milking parlour according to Claim 48, which furthermore has a container for



performing an intermediate disinfection in the disinfection position.

50. Milking parlour according to Claim 49, wherein the container has a device for disinfection of an outer area of the teat cup.

51. Milking parlour according to Claim 45 to 50, which furthermore comprises a hose guide mounted on the support, wherein the hose guide is formed to produce the fluid connection between the teat cups and the milk line in the first and second operational phases.

52. Actuator for inciting a movement of a teat cup cluster, with

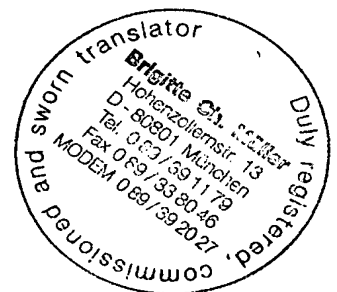
a retaining device (651) for fastening the actuator to a position at a distance from the teat cup cluster (610), and

an actuator element (652) that can be coupled to a flexible component (613, 614) that is connected to the teat cup cluster (610) during the milking process, in order to give the flexible component (613, 614) a movement in at least one direction.

53. Actuator according to Claim 52, which furthermore comprises a controller (660) that is functionally connected to the actuator element (652) and that is formed to induce a controlled movement in the actuator element (652).

54. Actuator according to Claim 53, wherein the controller (660) is formed to determine the intensity and / or the chronological sequence of the controlled movement.

55. Actuator according to Claim 54, wherein the controller (660) is furthermore formed to communicate with a sensor device (661, 662, 663, 663a) and to control the actuator element (652) on the basis of a signal of the sensor device (661, 662, 663, 663a).



56. Actuator according to Claim 55, wherein the sensor device (661, 662, 663, 663a) generates a signal representative for the status of the milking process and / or for the stimulation status of an animal.

57. Actuator according to one of the Claims 52 to 56, which furthermore is formed to control a pulsator (620) connected to the teat cup cluster.

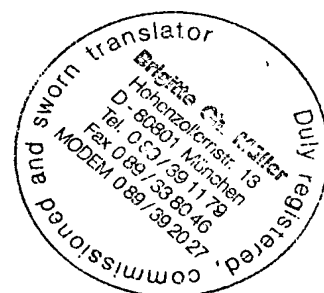
58. Actuator according to Claim 57, wherein the actuator is formed to control a folding frequency and / or pressurization of a teat cup liner pneumatically activated by the pulsator, at least during a stimulation period of the pulsator.

59. Actuator according to one of the Claims 52 to 58, wherein the actuator is furthermore formed to change a tilt of the longitudinal axes of teat cups of the teat cup cluster with respect to the animal udder during the milking process.

60. Actuator according to one of the Claims 52 to 59, wherein the actuator element is formed to give the flexible component a movement in at least a second direction, which is linearly independent of the first direction.

61. Actuator according to Claim 54, wherein the controller (660) furthermore is formed to estimate the deflection effected on the teat cup cluster by the actuator element for at least two different movements of the actuator element and to perform the activation of the actuator element on the basis of the estimate.

62. Actuator according to one of the Claims 52 to 61, wherein the actuator element can be coupled to a flexible milk hose and / or to a flexible pulsator hose, which is in a fluid connection with the teat cup cluster, in order to incite a movement.



63. Actuator according to one of the Claims 52 to 61, wherein the actuator element can be coupled to a device (670) that is provided for adjusting the orientation of the teat cups relative to the udder.

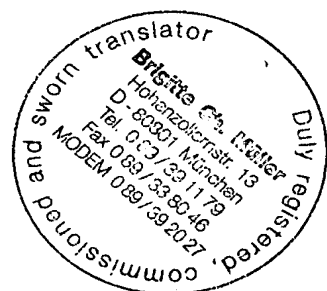
64. Actuator according to one of the Claims 52 to 63, wherein the actuator element comprises a pneumatic driving device.

65. Actuator according to one of the Claims 52 to 63, wherein the actuator element comprises an electric driving device.

66. Actuator according to Claim 64, which furthermore has a pneumatically driven converter in order to provide electrical energy for supplying one or more components.

67. Milking installation for milking animals by machine, said milking installation comprising
a vacuum system (630) that is formed to provide a vacuum needed for suctioning the milk,
a teat cup cluster (610) with a multiple number of teat cups in a fluid connection with the vacuum system (630) via first lines (613) that are flexible at least in sections,
a pulsator (620) that is in a fluid connection (614) with the teat cups via a second line that is flexible in sections and that is formed in such a way as to effect a folding of a teat cup liner in each of the teat cups in a controlled manner and
an actuator (650) according to one of the Claims 52 to 66.

68. Milking installation according to Claim 67, wherein the flexible component comprises a part of the first and / or second line.



69. Milking installation according to Claim 67 or 68, which furthermore comprises a pulling device for adjusting an angle of tilt of the teat cups on the udder.

70. Milking installation according to Claim 69, wherein the flexible component is a part of the pulling device.

71. Milking installation according to one of the Claims 67 to 70, which furthermore has a control device that is at least functionally connected to the actuator and that is formed to bring about in this actuator a controlled movement of the actuator element.

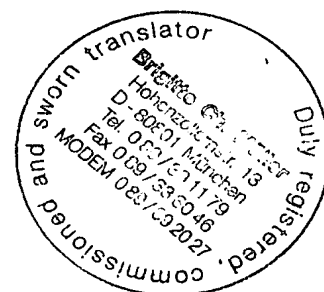
72. Milking installation according to Claim 71, wherein the control device is functionally connected to the pulsator and is formed to control the operation of the pulsator.

73. Milking installation according to one of the Claims 67 to 72, which furthermore comprises a sensor device for registering a characteristic that is relevant for the milking process.

74. Milking installation according to Claims 71 and 72, wherein the control device is formed to receive a sensor signal of the sensor device and to control the actuator on the basis of the sensor signal.

75. Milking installation according to Claim 74, wherein the sensor device and the control device are formed to communicate wirelessly.

76. Milking installation according to one of the Claims 73 to 75, wherein the sensor device is formed to generate a sensor signal that is representative for the status of the milking process and / or the stimulation status of the animal.



77. Milking installation according to Claim 73, wherein the sensor device is formed to register a movement of the teat cup cluster or a part of the teat cup cluster.

78. Milking installation according to Claim 77, wherein the control device is formed to control the actuator element on the basis of the registered movement.

79. Milking installation according to one of the Claims 71 to 78, wherein the control device is furthermore formed to estimate the deflection effected on the teat cup cluster by the actuator element for at least two different movements of the actuator element and to perform the activation of the actuator element on the basis of the estimate.

